1:Redfield E-5 (1926-1927)1930
NU37 Tepoztlan NU37

them from the sky. They covet gold; now that the rains have begun and the voices of the *ahuahque* are frequently heard, women who most fear them take off their gold earrings for fear that the *ahuahque* might strike them dead so as to take the jewels.

People are busy now, and contented. There is work for all the men in the *milpas*. The ground is prepared with a wooden plow. For new-broken or very stony earth there are a few steel plowshares. Oxen, less commonly horses or mules, draw the plow. By now the corn is a foot high up at San Juan, but in Tepoztlán a hotter sun demands that the maize be planted after the rains have come. By the middle of June most of the *milpas* are planted. At San Juan the grain is dropped into holes made with a pointed stick. In Tepoztlán it is dribbled along in furrows; afterward the earth is heaped up around the young plant with the *coa*, the flat hoe with a curved blade.

June 15.—The *chirimía* plays on the roof of the Templo Mayor because tomorrow is the *fiesta* of Corpus Christi.

In May or June.—This is the day of the *fiesta* of Corpus Christi, *Jueves de corpos*. Some go to Yautepec or to Cuernavaca to buy little *burros* made of straw bearing crates of fruits and sweets.

July 22.—This is the day of the *fiesta* of the hamlet of Amatlán. (This is the saint day of Mary Magdalene, patron of this village.)

July 25.—This is the day of the *fiesta* of the village of Santiago. *Los Apaches* dance at both these *fiestas*.

1:Redfield E-5 (1926-1927)1930
NU37 Tepoztlan NU37

*796 Those who have dead to commemorate carry candles.
769 These are lit on the graves. Prayers and responses are
782 said there, and the party remains until eight in the evening. For the responses the priest is given money by all who celebrate their dead.

●243 In December the rains have stopped and the air is
[132] very clear. The corn is ripe now, and the harvest begins. The roads are dusty from the feet of men, *burros*, and horses, going to the fields with empty sacks or returning to the village with loads of maize. In the fields groups of men move along the rows, removing the ears from the stalks. A broad needle of wood or iron is suspended from each wrist and used to slit the husks away from the ears. The husks and stalks are left as they were; later groups of women will collect the husks (*totomochtli*) and bind them into bundles to
[231] be used to wrap *tamales*. Still later the stalks will be cut down with the *machete* for fodder.

243 The men always work in groups; the owner of the
476 field has asked them to help him—it is *cuatequitl*—and then when their fields are ripe he will help them harvest. These are social occasions. Each group of
[273] men has *la mulita*, "the little mule"—a bottle of alcohol hidden under a pile of corn. The preparation of their dinner is also done co-operatively at the house of the owner of the field, and this is a social occasion for the women. They carry the dinner to the fields for the men. The owner of the field supplies the food and drink. But here the co-operative harvesting ends, for

* See p. 146.

1:Redfield E-5 (1926-1927) 1930
NU37 Tepoztlan NU37

the removal of the grain is done separately in each individual house, each member of the family taking a hand.

December 7.—The *chirimía* plays on the Templo Mayor; this, with the ringing of the bells, announces that tomorrow will be the *fiesta* of La Virgen Purísima.

December 8.—This is the day of the *fiesta* of La Virgen Purísima. The *chirimía* plays again. At dawn rockets are set off in the churchyard. This is not an important *fiesta*. There are special masses when the priest is there. In the afternoon mothers bring their little girls, dressed in white as for a confirmation, with white crowns on their hair, to the Templo Mayor. Each child offers a bouquet of flowers to the Virgin.[1]

December 11.—The *chirimía* plays again.

December 12.—This is the day of the *fiesta* of Nuestra Señora de Guadalupe. The usual *chirimía*, bells, and rockets celebrate the *fiesta*. This is not an important *fiesta* in Tepoztlán, although the Virgin of Guadalupe is the patron of the Indians of Mexico. Some from Tepoztlán go to the great celebration at Guadalupe.

The attention of the community is focused on the harvest. Almost every man is working in the fields. The carpenter neglects his bench, the iron worker his forge. The corn factors have arranged counters in the doors of their houses. There they receive the corn as it is brought them, measuring it out in small wooden

[1] They do this again in May (the *mes de María*); and in June little boys bring flowers to the *Sagrado Corazón de Jesús*.

1:Redfield E-5 (1926-1927)1930
NU37 Tepoztlan NU37

scoops, paying perhaps eight or nine *centavos* a *cuartillo*.

By the third week in December the fields below the town are still and empty. The last loads carried by the *burros* are of round green squashes, grown among the corn. Into some fields the cattle are turned to forage. Above the town, where the fields ripen later, the harvesting continues, but the work is on the wane. There is time to rest now, and enjoy the Christmas *fiestas*. Preparations are under way. In many houses, particularly in those nearest the *plaza*, where Spanish influence is strongest and where there may be a little money to spend, the nine *posadas* are celebrated as they are celebrated all over Mexico. By this time the matrons of the neighborhood have arranged in whose house will take place each of the nine *fiestas*. Nine women will take turns as hostess, dividing the responsibility and the expense. Someone has gone to Oacalco for sugar cane, to Yautepec for peanuts. The women are making little paper baskets (*alcartazes*) to hold candies and peanuts.

It is not in one of the larger houses near the *plaza* that boys are learning to sing the songs of *Los Pastores*. In the yard of a smaller, more Indian house in some street off the *plaza* a score or more of boys are seated on the ground learning the songs from a *maestro* who is the repository of this local tradition.

The *mayordomos*, with their assistants, decorate the chapels with flowers and cedar boughs and colored tissue paper. People cut branches of poinsettia, now

1:Redfield E-5 (1926-1927)1930
NU37 Tepoztlan NU37

527 *ihuan chicome tlamimilolli;*
536 *'huan chicome tlaltemimilolli;*[1]
and [the] seven stony hillsides;

539 *no-ayochicahualiz ihuan no-ayotlahpalihuiz?*
in no-ayochicaualiz 'huan no-ayotlapalihuiz?
they are my valor and my essential strength?

Nicnochicahua noyollo!
Nic-chicahua in noyollo!
I fortify my heart!

Maxihuala, tehuatl ti Tlayecapanecatl!
Ma xihuallauh in ti Tlayecapanecatl!
Come forward, thou of Tlayacapan!

tlein ipampa tinechtemohua?
Tlein ipampa in ti-nechtemohua?
Why dost thou seek me?

Cahuel nelli queh oquimohtlahui yehuatzin,
Ca-uel-nelli queh oquimo'talhui[2] *in yehuatzin,*
It is quite true as she, the aunt, said who shines

te ahuitzin, ompa ilhuicacxitoni,
te-ahuitzin,[3] *ompa ilhuicac-xitoni,*
there in the heavens,

[1] *Tlalte-mimilolli*, the rough, broken hill- or mountain-side; *tlaltetl*, "earth-stone," a ball of earth, clay, conglomerate, or volcanic matter found in abundance on the mountain slopes of the valley of Mexico; *mimiloa*, "to extend," "to increase," "to roll."

[2] *Mo'talhui; italhui*, "to speak," "to say," "to explain."

[3] *Te-ahuitzin*, the aunt (in general), substituted for *te-ci*, the aunt of one's grandparents. Teci was the ancestor of gods and men and the antecessor of Our Lady of Guadalupe at Tepeyac (Guadalupe). As the wife of the fire-god, in the older Mexican mythology, she was the goddess of birth and fertility and the ruler, like her husband, of the three divisions of the universe, the superterrestrial (all above the earth); the terrestrial (on the earth), and the subterrestrial (below the earth). Teci was the "hare in the moon" and, by metathesis, the moon herself, who assumed all the attributes of the goddess. When the grain was gathered in, the Mexican people held a great festival in (September) in honor of Teci (identified with the moon). The *Tepoztec* play seems to have been written to

1:Redfield E-5 (1926-1927) 1930
NU37 Tepoztlan NU37

metztli oquimoxopehpechtihtzino. 527
meztli oquimoxopechtihtzino.[1] 536
she, the moon, has made her dwelling [foundations]. 539

matlactli ihuan ome cicitlaltin
Matlactli 'huan ome cicitlaltin
Twelve stars she has
oquimo xochi-icpacuiltitzino.
o-qui-mo-xoch'-icpac-cuiltitzino.
[like] flowers placed on her head.

omotlacempanahuilli ompa ilhuicac;
omotlacempanahuilli ompan in ilhuicac;
She has surpassed, there in the sky, all;

ihuan nican tlalticpac;
ihuan nican in tlalticpac;
and here on earth;

ihuan nohuiampa cemanahuac.
ihuan nohuiampa cemanáhuac.
and everywhere in the universe.

Maxihuala, Tehuatl in ti-Huaxtepecatl!
Ma xihuallauh,[2] *tehuatl in ti, Huaxtepecatl!*
Come forward, thou of Huaxtepec!

---

take the place of this old autumn festival. The reference in the text is to the old heathen belief of the "old aunt" or ancestor, Teci, the moon, holding her court in the sky, amid the stars. Teci was frequently identified with Chicome-xochitl ("Seven-Flowers"), the goddess of birth, who had her home among the stars. This is probably the reference, in the text, to the seven flowers and the seven stars. The Indians associated the Virgin with the moon. 776 243 177 821

[1] *Oquimoxopechtihtzino* (rev. form), "has made her foundation," that is, all that lies beneath her, over which she rules or has dominion. *Xopechtli*, "foundation," is verbalized by the suffixing of *-tia*, "to make," and the prefixing of *mo*, for "one's self." As verb it takes the objective pronoun *qui* = "has-it-for-herself-foundation-made."

[2] *Ma xihuallauh*, imperative of *huallauh*, "to come toward." This word is frequently written incorrectly because, in ordinary conversation, the *uh-termination* is not pronounced. This *-uh* formed one of the poetic licenses of the Aztec poets, who pronounced it or not according to the necessities of the meter.

2:Lewis E-5 (1943-1948)1951 NU37 Tepoztlan NU37

423 631 628 578 [474] [314] [177] terests of a small clique within that village. The schisms created by this cooperative within the village and the municipio will be treated later in this study.

These facts indicate the strong individualism of the villagers, and the interesting way in which new contacts with the outside and production for the market have disrupted the earlier stability of the municipio. As long as production of charcoal was primarily for household use, there seemed to be no conflict between collective ownership and individual exploitation of the resources. As a matter of fact, the communal lands have been one of the few unifying factors in the life of the municipio and have brought the villagers together to defend their lands in the face of threats from the outside. However, with commercial exploitation of the limited communal resources, competition became intense, and the concept of communal land ownership by the municipio was attacked.

PRIVATE HOLDINGS

423 175 As we have indicated earlier, private landholdings include most of the lands for plow agriculture; that is, most of the level lands. The only other privately owned lands are the house sites in the village, most of which include some ground for a garden and for some corn plantings. The history of private landholdings is not very clear. Certainly we know that private holdings have existed at least since the time of the Conquest. Whether or not it existed in Tepoztlán before the Conquest cannot be determined, but, judging from the data for other parts of Mexico, it is probable that private holdings coexisted with other holdings. Much of the land that is now privately owned, approximately one hundred hectares of the most productive lands of the municipio, once belonged to the church. This land was divided into private holdings after the Revolution of 1857. Most of the landowners now have 423 some document to prove title; but there are still many individuals who work plots of land which have been passed down from family to family without any written proof of ownership.

[55] [183] The ownership of land is one of the basic aspirations of Tepoztecan peasants, and land-ownership is perhaps their most important single criterion of wealth. The value put on land-ownership is reflected, in part, by the fact that farmers, artisans, and merchants invest in land whenever they have the necessary capital and the opportunity. But there is no concentration of land-ownership in the hands of a few. [432] There are several reasons for this. Few people in Tepoztlán will sell tillable land, and when they do they prefer to sell to close relatives. On the whole there is little land turnover. Tepoztecans with sufficient capital to purchase large quantities of [422] land do not do so, because they seek more profitable kinds of investments, generally in cattle. The high cost of labor and the low and uneven yields in plow [243] agriculture make corn production for commercial purposes unprofitable.

DISTRIBUTION OF PRIVATE HOLDINGS

[183] According to our findings, only 36 per cent or 311 of the 853 families in the village own private land. Thus, in a village where the family ideal is to own a plot

2:Lewis E-5 (1943-1948)1951 NU37 Tepoztlan NU37

than nine hectares in size, and 68.4 per cent are less than four hectares. The two largest holdings are only between twenty-five and twenty-nine hectares. A man with fifteen or more hectares is considered a large landowner; only 3.3 per cent of holdings are of this size. The smallest holdings, of which there are many, are as low as two *cuartillos* (one-fifth of a hectare) in size.

TABLE 21. Size of Privately Owned Landholdings.

Size of Holdings (Hectares)	Number of Owners	Per Cent of Owners
0–1	109	36.2
1–4	97	32.2
5–9	67	22.2
10–14	18	5.9
15–19	4	1.3
20–24	4	1.3
25–29	2	.7

The distribution of privately owned land by size of plot and by barrio is shown in Table 22. It is evident from this table that there is a higher proportion of the small holdings (less than one hectare) in the smaller barrios. This is significant in view of the fact that we have seen in Table 20 that there was a larger proportion of landowners in the smaller barrios. For example, although 53.6 per cent of the families of Santa Cruz (large) were landowners, 54.5 per cent of them had holdings of less than one hectare. On the other hand, in the larger barrio of San Miguel, in which 38.3 per cent of its families were landowners, only 18.07 per cent owned holdings of less than one hectare. Furthermore, while Santa Cruz (large) has no landowners with more than nine hectares, San Miguel has eight such landowners.

The greatest extremes in size of holdings are found in the large barrios, with the single exception of Los Reyes, one of the smaller barrios.[6] We have already seen that Los Reyes is also unusual in that it has the highest percentage of landowners. In general, these figures show that there is considerable range in the size of holdings by barrios.

The size of cornfields is small, because holdings are generally in small parcels located in different places. I have never seen a cornfield in Tepoztlán larger than 35 *cuartillos*, or three and one-half hectares. Although a few of the larger operators plant as much as one hundred *cuartillos* of corn, or approximately ten hectares of land, this would be divided among a number of small parcels. Operators of these larger plots own at least two teams of oxen and have enough capital for hired labor.

EJIDO *HOLDINGS*

Two hundred and sixty-seven families, or 31 per cent of all families, hold *ejido* grants. It is interesting that most of the cases of two members of a single family

[6] The case of Santa Cruz (small) presents a somewhat special problem; it adjoins the barrio of Santo Domingo and is not literally a separate barrio, for it owes allegiance to Santa Cruz (large).

2;Lewis E-5 (1943-1948)1951 NU37 Tepoztlan NU37

tween *sitios urbanos* (urban house sites) and *predios rústicos* (rural parcels), and they are listed separately in the property register. Furthermore, a Tepoztecan who owns only an urban house site is not considered a landowner. This, despite the fact that some *sitios* have sufficient land to plant a patch of corn. Traditionally, the house site milpas are used principally for fresh corn. In 1944, however, less than 20 per cent of all house sites were planted in corn, a lower figure no doubt than that prevailing in 1926; as the population is increasing, the house sites are getting smaller because they are usually divided up for purposes of inheritance.

Second, Redfield's statement concerning the "appendant milpa" may refer to an old pattern which has not existed in the village since long before the Revolution of 1910, and I could find only a vague tradition of it remembered by a few older informants. After some investigation of this point I could not find a single example of a house site in the village with an "appendant milpa." The inheritance pattern that prevails today and that, as far as I was able to determine, has prevailed for a long time would rule out the situation of each house site having an "appendant milpa." It is common practice for the father to divide the inheritance, so that the house site goes to one child and the milpa to another.

It is possible that the conception of Tepoztecans as a landed peasantry was taken up from Redfield by Stuart Chase, who described Tepoztlán as a village with economic security. This is especially ironical in view of the fact that Tepoztlán was in the heart of Zapata country and was one of the first villages in Morelos to join the Revolution which, in this region, was essentially a bitter struggle for the land.

It has become traditional among historians, economists, and sociologists, in writing on the history of the agrarian problem in Mexico, to distinguish between two fundamental types of social and economic organization: the so-called free village and the hacienda. The free village represents the older Indian form of organization, and the hacienda represents the Spanish form. Much of Mexican history has been described as a struggle between these two ways of life. One of the best statements on this situation is the following:

> The stage is set. On the one hand is the institution of private property, already present in its incipient forms in pre-Conquest days, but now, with the importation of the *encomienda*, the *pronia*, and *caballería*, fortified, strengthened, and ready to develop in stature and power until soon it stands full grown as the classic type of landed estate—the hacienda. On the other hand is the landholding, communal village rooted deep in age-old custom and tradition and now given life and legal support in the reorganized native pueblo and in the scores of new villages soon to be founded on the Indian model. From this point of view the history of Mexico is, in its most fundamental aspects the drama of the struggle between feudalism and the free village, between the individual private estate and the collective, communal holding-in fine, between the hacienda and the *ejido*. For almost four hundred years it is the hacienda which wins. The victories of the villages are only temporary triumphs; slowly but surely the *ejido* is pushed back and back until by the turn of the twentieth century only in the mountain fastness and in a

2:Lewis E-5 (1943-1948) 1951 NU37 Tepoztlan NU37

TABLE 28. Distribution of Ownership of Plows, Oxen, and Land, 1944.

Barrio	Families Owning Plows	Families Owning Oxen	Families Owning Land
San Miguel	48	44	83
Santo Domingo	70	50	61
La Santísima	36	32	62
Santa Cruz (large)	14	14	44
Los Reyes	23	21	30
San Sebastián	8	6	11
Santa Cruz (small)	8	6	10
San Pedro	6	6	10
Tepoztlán	213	179	311

TABLE 29. Cost of Oxen, Rental of Oxen, and Wages.

Year	Cost of Oxen[a]	Rental of Oxen per Day (With Driver)	Rental of Oxen per Three Months		Wages of *Peón* per Day
			In Corn[b]	In Pesos	
1926–30	60.00	1.50	6	40.00	50
1936	70.00	2.50	8	75 00	1 00
1940	100.00	3.25	8	125 00	1 25
1942	125.00	4.00	7	150 00	1 50
1943	200.00	5 00	7	150 00	1 50 2 00
1944 (April)	400.00	6.00	7	170 00	2 50 3 00
1944 (July)	400.00	7.50 10 00	7	200 00	3.00 3.50

[a] Cost in Guerrero.
[b] By 160 *cuartillos*.

WORK CYCLE AND PRODUCTION TECHNIQUES

The work cycle of plow culture in Tepoztlán is in four stages: preparation of the land, planting, cultivation, and harvest.

Preparation of Land: In discussing the preparation of the land, we must distinguish between breaking new land, or land that has been idle for a number of years, and preparing land that was under cultivation the year before. In the former case the process is referred to as the *barbecho* (breaking of new land); in the latter as *los tres arados* (the three plowings). The system of plowing used in each case differs considerably. Some Tepoztecans begin their first *barbecho* in the dry or slack season, generally in March. However, at this time the earth is parched and hard, and plowing is difficult and slow. For this reason, farmers prefer to break new land during the rainy season, generally in August, in preparation for the following year. If the weeds are tall and strong they are cut with a machete, piled up to dry, and are burned.[6] It takes a man about three days to clear a heavily

[6] The most stubborn weeds are known as *zacate chino*. These have deep roots, and if the field is heavily weeded it is necesary to plow in January and again in March. The older men say that this weed came in after the Revolution.

2:Lewis E-5 (1943-1948)1951 NU37 Tepoztlan NU37

243 weeded field of one hectare. Whenever possible the weeds are plowed under to improve the fertility of the soil. The steel plow is used in the *barbecho*, and the land is plowed in one continuous furrow to make a concentric rectangular form.

If the field is large, it may be divided into two or three parts, each of which is plowed in the same fashion. The land is always plowed at right angles to the direction in which the rows of corn are to be planted, so that the rows can be kept straight. Tepoztecans pride themselves on having straight rows of corn, and farmers [461] will compete with one another to see who can plow the straightest. One man with a single team of oxen can plow on an average of about two *cuartillos* a day. If time permits, two *barbechos* will be given; the second is always done soon after the first rains, toward the end of May or early in June.

In the case of *los tres arados* which is used in preparing a field that has been in cultivation the previous year,[1] the steel plow is also used, and the plowing follows the old corn beds and furrows. The plow is placed just to the right of the old cornstalks, and the earth is turned to the right. This is called the *primer arado* (first plowing). When the oxen reach the end of the furrow they are turned, and the same process is followed on the adjoining corn bed, so that a new mound of earth is formed where the furrow was before. This is called the *segundo arado* (second plowing). In both the first and second plowing a short yoke is used, and [492] the oxen walk in the furrows on either side of the corn bed. The plow driver walks to the left of the bed, holds the plow with his right hand, and directs the oxen with his left. The *tercer arado* (third plowing) goes through the center of the corn bed. The third plowing forms part of the process of planting.

243 *Planting:* This generally begins a few days after the ground has been plowed, 221 preferably when the earth is humid. But it is important to note that in Tepoztlán there is a great deal of leeway in the time of planting. A few days or even a few weeks make very little difference in the net results. Corn can be planted any time between June 1 and July 25 with a fairly good chance of getting a crop. Tepoztecans, [461] therefore, follow no rigid work cycle. Of approximately four hundred farmers who may plant corn with plow and oxen in any one year, no more than a third begin their work immediately after the first rains. The reasons for this are varied. Many own neither land nor oxen and may be delayed in making arrangements for renting, in preparing their tools, plows, and yokes; others may still be busy selling wood and charcoal; still others may be delayed by illness or death in the family. It is a common sight in Tepoztlán to see corn at various stages of growth during the rainy season.

243 The selection of seed for planting is generally done soon after the harvest in 242 January, when the finest ears of corn are set aside to be shelled later in May or June, just before planting. Three types of corn are used in plow culture, *ancho*

[433] [461] [1] Some use the *barbecho* on land that has been cultivated the year before, and then follow with *los tres arados*. This gives a better yield but involves at least three additional days of work for a plot of twenty *cuartillos* or approximately two hectares. Only the best farmers, about ten per cent, do this.

2:Lewis E-5 (1943-1948) 1951 NU37 Tepoztlan NU37

blanco, pepitillo blanco, and *semilla azul.*[8] *Ancho blanco* is the most widely used corn; *pepitillo* is used only in the heavier clay soils. *Semilla azul* is used for replanting cornfields which have not germinated, because it ripens faster and catches up with the earlier plantings.

A large number of Tepoztecans still follow the custom of having the seed blessed by the priest on the day of San Isidro, May fifteenth. Generally the women take the corn to the church. Each woman selects about ten of the finest ears of corn, as well as some of her best beans and squash. She may also take along some copal and a censer. As many as two hundred women may attend this blessing. As they burn the incense in the church, the priest comes out and blesses the seed with holy water. The ears of corn which have been blessed are to be placed in the milpas to rot and must not be burned, or the seed will not grow.

The ancient custom of addressing the seed in Náhuatl, before planting, is still remembered by most men over age fifty. Many informants recall that their grandfathers spoke to the corn in a short formal ritual, before planting. The ceremony in the fields was often accompanied by great emotion and even weeping. One of these speeches translated from the Náhuatl follows:

"My beloved body and strength, go and bear the cold and the storm of the seasons; all is for us."[9]

Today a similar ritual is still followed by a relatively small number of Tepoztecans, except that the recitations include references to God and are said in Spanish. The following are examples of present-day blessings:

> God bless you. I bury you and if you return while I still live the satisfaction will be mine; if not then my descendants.
>
> In the name of God I am going to plant this seed. I implore Thee to bless my work.
>
> Bless your sainted name God Our Father who is the first one to care for us. From here you go out and from where you go out God wishes you to return. For I am going to throw you into the field and you will remain only with the blessing of God. And may God free you so that we all will have something.

In planting corn, two men and one team of oxen are the minimum requirement. More than one team is rarely employed on a single field. However, two or three men may be used if the owner has a large family or can afford to hire *peones*. In planting on land that has been newly broken, the plow is always pulled at right angles to the existing furrows. One man, the oxen driver, leads the oxen while another man follows and drops four seeds in the furrow for each plant at a space of about a pace apart. The seed is dropped in front of the left toe, and the dirt is pushed over the seeds with the right foot. In planting the first few seeds, some Tepoztecans still follow the old custom of making the sign of the cross with their hand as they drop the seeds. Older men believe that planting one day after the

[8] See Appendix A, p. 449.

[9] "Notlashocuyo yocatzia xomohuiaretzi quez quish cequisti tonalli huan yeccatl timochocal huitiul tepampa."

2:Lewis E-5 (1943-1948)1951 NU37 Tepoztlan NU37

243 [821] 492 [244] appearance of the new moon brings a better harvest. The rows of corn are 80 or 90 cm. apart, depending upon the fertility of the field. Yokes are therefore two standard sizes.

Some farmers mix their corn seed with beans: *frijol chino, pepita,* and *frijol colorado.* When this is done, no special number of seed is used. After the first cultivation, *frijol negro* or *bayo* may be planted between the corn hills.

In planting a field that has been prepared by the *dos arados* rather than by the *barbecho,* the plow is directed right through the middle of the old corn beds, and this is known as the *tercer arado,* completing the three plowings involved in the preparation and planting. Both in the newly broken ground and in the land that [407] has been in cultivation the preceding year, the *arado criollo* (wooden plow) is used in planting, and a piece of wood is inserted which acts as a double mouldboard and throws the earth to both sides. The amount of corn that is planted per day depends upon the type of corn and the speed of the oxen and driver. On the average, two men working with a team of oxen can plant eight to ten *cuartillos* of *maíz ancho* per day, and about five to six *cuartillos* of *maíz pepitillo.*

First Cultivation: Two or three cultivations are generally given to cornfields; these cultivations are known as *el primer mano* or *el primer beneficio, el segundo mano,* and *el tercer mano.*

The first cultivation of the corn is generally done twenty days after the planting when the corn shoots are still very small.[10] Again the steel plow and the short yoke is used, and the oxen walk between the furrows on either side of the corn bed. The plow is pulled to the right of the row of young corn, so that the earth is turned away from the corn. The driver walks to the left of the row and holds the plow with his right hand. Two *peones* are used in addition to the driver. The *peones* follow the plow, staying on the left side of the row of corn; they bend over the corn and with their hands they carefully push the earth around the young plants. The two *peones* work simultaneously about twenty feet apart and by-pass each other when they reach a section that has already been cultivated. The first cultivation of a plot of ten to twelve *cuartillos,* using two *peones,* takes on an average of two days.

[825] [824] Tepoztecans have an ingenious way of fighting ants which threaten the young corn. When the young shoots are about to appear, they take the leaves of a tree called *yamatl* (of the *amate* family), chop up the leaves, and sprinkle them over the rows of corn, and especially on ant nests. The ants prefer this leaf to corn, and Tepoztecans claim it makes them thin and eventually kills them. The leaf contains a white, milky substance so strong that it will peel the skin off a man's hand. Another tree whose leaves are used for the same purpose is *yoyohtli.*

Second Cultivation: The second cultivation begins about twenty days after the first cultivation is completed, generally in the last week of July. The process is very

[10] In fields which have gathered much water, Tepoztecans may plow in the furrows about eight days after planting, to spread the water. Such plowing is called *sobrenal.*

2:Lewis E-5 (1943-1948) 1951 NU37 Tepoztlan NU37

243 much the same except that the plowing is deeper, and the steel plow is pulled to the left of the row of corn, and the earth is turned to the right toward the plant. This work is generally done with one team of oxen, the driver, and only one helper who follows the plow and sees that the plants are not bruised or injured. This second cultivation involves less work than the first because the corn is taller and stronger,

[407]

Fig. 27. Mouldboard plow.

and less care is needed in piling earth around the plants. An average of ten *cuartillos* of corn can be cultivated in this manner in two days.

Third Cultivation: Twenty days later the third and final cultivation begins. This time the wooden plow is used with a wide yoke for the oxen who walk two rows apart. The plow is directed between the two rows of corn, and a board is placed [407] in the plow so that the earth is turned on both sides, thereby piling up the soil on the two rows of corn at once. (See Fig. 27.) Only one team, one driver, and one helper are needed for the third cultivation and eight to ten *cuartillos* of corn can be done per day.

After the third cultivation the corn plants in the first and last two rows of the milpa are hilled by hand with the *coa*. This hilling also serves as a symbol that the cultivation is over and is looked upon as a decoration or adornment of the work of

2;Lewis E-5 (1943-1948)1951 NU37 Tepoztlan NU37

243 cultivation. However, it probably also serves to strengthen the outside rows against the wind, and Tepoztecans believe that it protects the inside of the milpa.

In the more fertile lands which are in the lower and lower portions of the municipio, it is customary to hill all the plants because the corn grows so fast that a third cultivation with oxen would damage the tall plants. The hilling of each plant requires much more labor, and therefore necessitates more capital when *peones* are hired for the job. In areas within the municipio such as Calamatlán, where this hilling is done, the process is referred to as *una tierra y medio cajón*, that is, one cultivation followed by hilling. The hilling is believed to safeguard the tall plants against the winds.

527 The termination of cultivation is known as the *acabada* and is celebrated by a
243 fiesta in the fields and at home. This generally occurs toward mid-August. Im-
[788] mediately after the last hilling, some Tepoztecans walk around the milpa and re-
[534] cite a speech. The following is a typical speech.

Now I have fulfilled my obligation of attending and cultivating you as you deserve. Now if you do not want to produce, that is your responsibility. For my part I now retire.

[778] A wooden cross is sometimes put in the center of the milpa after the last row
[264] is cultivated and prayers and religious songs are said by the owner. Fireworks are set off and bread and cheese, tequila and *ponche* are served to the workers and others present. The oxen are decorated with flowers, generally dahlias, tulips, and banana leaves, and a picture of San Isidro. After celebrating in the milpa the oxen are driven home, where there is more food and drink for the *peones*, the family, and any *compadres* and friends who may be invited. Tamales, rice, tortilla, *mole verde*, and drinks of *ponche* are plentiful, and firecrackers are set off in the patio.

[264] The last cultivation and its celebration are generally over by late August. There
243 follows a long period during which relatively little is done in the cornfields. Dur-
[245] ing this time the farmers harvest their *ciruela* crops, which ripen in early September.

[527] Toward the end of September the fresh corn is ready in the fields, and families
[778] turn out to the milpas to roast corn and to drink *ponche*. On September 28, the day
[788] of Saint Miguel, the farmers carry a cross made of *pericón*, which has been blessed
[821] by the priest, and they place it on the four sides of the milpa to protect it against
[789] strong winds which often blow at this time. It is an old belief that if the winds
[770] blow strong and the corn is damaged it is because the dancers who represent El Tepozteco at the fiesta on September 8 did not perform properly. While this explanation is widely known, few still believe it. Another old idea is that the wind is caused by the angels spreading their wings.

During October the weeding of the milpa with machete is done wherever necessary. A milpa of ten or twelve *cuartillos* can generally be done by a man in one or two days. After that there is a long period when no work in the milpa is
[245] done. During this time farmers continue to pick their *ciruelas*, look after their animals, cut wood, and do other tasks around the house.

2:Lewis E-5 (1943-1948) 1951 NU37 Tepoztlan NU37

Harvest: The harvest generally consists of two stages. The first is stripping the cornstalks of their leaves. This process is known as the *zacateo* and begins in early November. The leaves are bundled and transported to the house, where they are used for fodder. Stripping a cornfield of ten or twelve *cuartillos* takes six days of work. Sometimes men will compete to see who can strip two rows in the shortest time. The *zacate* is tied into bundles or *gavillas*. Twelve *gavillas* make up one *manojo* and twelve *manojos* make up one *carga*. These *cargas* of *zacate* are transported home on horse or mule. The transporting of the *zacate* produced on a field of ten to twelve *cuahtillos* takes three days of work, using two mules and making two trips a day.

The harvest of the corn itself begins in early December.[11] It takes about five days of work to pick the corn on a field of one hectare. A good worker can pick approximately two *cargas* of corn a day. The corn, like the *zacate*, is transported by mule and it takes about the same time, that is, three days. It is customary to celebrate the harvest by serving *pozche* to the helpers and to the men who are hired to transport the corn. During the harvest the wives may help in stripping the leaves off the ears of corn. These leaves are known as *totomaxtli* and are used in making tamales. Widows often ask for permission to gather corn leaves to sell.

The *cuatequitl* or unpaid cooperative labor system referred to earlier is reserved exclusively for the planting, cultivation, and harvesting of the land owned by the barrio for the support of its chapel, and working the barrio land is the only occasion for unpaid collective labor in agriculture. There are cases of labor exchange between relatives, but this is viewed as very different from *cuatequitl*. I should like to emphasize this point, for Tepoztecan farming is highly individualistic and in this sense quite similar to our own farming.

There is some time pressure in harvesting, in those cases in which many privately owned plots are encircled by a single fence or stone wall. The farmer who has completed his harvest is entitled to allow his animals to graze, and this endangers the corn on those fields not yet harvested. To avoid this danger and the many quarrels resulting from it, the farmers within a single enclosure generally come to some agreement to have their plots harvested within a specified time, which agreement is registered with the local authorities. Although this situation would seem to call for cooperative harvesting, each family, with the aid of hired labor, harvests its own field.

In the first few days of January most farmers begin to store the corn in the storage bins that are of two types, the *xincolotes* and the *ahuatlapiles*. The corn is generally stored without being shelled so that it will better resist the corn worms which are a great problem to Tepoztecans. Sometimes a considerable portion of the harvest is eaten or spoiled by these worms. It is customary in many families to leave the corn on the cob until April or May; prior to that, they shell only what they need.

[11] Formerly stripping and harvesting were begun after the appearance of the full moon.

2;Lewis E-5 (1943-1948)1951 NU37 Tepoztlan NU37

243 476 114 The harvesting of corn, like all other operations in agriculture, is done on an individual family basis, with hired help if necessary. There is a minimum of labor exchange and cooperation. Our findings differ from those of Redfield. Redfield writes:

> The men always work in groups; the owner of the field has asked them to help him—it it is *cuatequitl*—and then when their fields are ripe he will help them harvest. These are social occasions. Each group has *la muleta*, "the little mule"—a bottle of alcohol hidden under a pile of corn. The preparation of their dinner is also done cooperatively at the house of the owner of the field, and this is a social occasion for the women. They carry the dinner to the fields for the men. The owner of the fields supplies the food and drink. But there the cooperative harvesting ends, for the removal of the grain is done separately in each individual house, each member of the family taking a hand.[20]

This account refers to a type of cooperation which does not now exist in Tepoztlán, and our informants did not remember its having existed in 1926 or even before the Revolution of 1910. Corn is shelled by both men and women. 243 462 [412] Women generally shell corn by hand in small quantities for daily use in the house and for small-scale trade. Large-scale shelling by the *carga* is generally done by the men who use an *elotero*, which is made of dry corncobs bound together in the form of a flat disc, over which the corn to be shelled is rubbed. Some use the black volcanic rock from the *texcal* for shelling. However, the corn selected for [621] seed is shelled by hand by the men. Women of the two upper barrios of San Pedro and Los Reyes frequently shell corn on a large scale, whereas in the larger, center barrios, large-scale shelling is considered a man's work. In many cases *peones* are hired for this job. The shelled corn is stored in sacks, for the most part, 251 [825] [824] [788] [76] although there are still a few of the old *cuescomatl*. (See Fig. 28.) Many families put the skeleton of a dog's head or a piece of *ocote* wood and lime in the sacks or the *cuescomatl* to protect the corn against spoilage. Formerly when *cuescomatls* were made, the priest would be called to bless them. There is a belief that when a death occurs, the corn in the house or on the house site will be more subject to the ravages of insects.

[242] The loss of stored corn from insects is one of the serious problems faced by Tepoztecans. Many farmers complain that they lose a few *cargas* a year in this fashion. It is rare to find corn that lasts through to August without being seriously damaged by corn worms. Tepoztecans have still received little help with this problem from Mexican agronomists.

243 825 231 An old tradition persists in the village to the effect that the boa constrictor was formerly used to prevent stealing of corn from the cornfields and the granary. It is said that the snake was fed salt and *tequesquite* by the owner of the field, and that thereafter the snake would frighten all strangers by climbing up the cornstalk and making a whistling noise. These snakes were apparently tame and did not harm the owner, but would attack strangers. There seems to have been some

[20] Redfield, *Tepoztlán*, pp. 126-27.

2:Lewis E-5 (1943-1948) 1951 NU37 Tepostlan NU37

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Fig. 28. The *cuexcomatl* for storing corn.

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magical qualities associated with the boa constrictor, for it was believed that a man who had tamed one would always have a good yield in his milpa, and that the seed would not be subject to insects.

YIELD

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The yield of corn varies a great deal from field to field and from year to year on the same field. Table 30 shows something of this range for specific fields of varying size.

Table 30. Estimates of Corn Yields in Plow Culture, 1944.

Size of Milpa (Amount of Seed Planted in *Cuartillos*)	Yield in Ears of Corn by *Carga*	Yield in Shelled Corn by *Carga*
14.0	30.0	20.0
22.0	34.0	23.0
8.0	15.0	10.0
6.0	7.5	5.0
7.5	13.5	9.0
10.0	7.5	5.0
12.0	9.0	6.0

Judging from these figures, we would get an average production of 9.6 *cargas* of shelled corn a hectare. However, it is possible to arrive at a much more useful

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estimate if we follow Tepoztecan classifications: First-class land will produce on an average of two *cargas* of ears of corn for every *cuartillo* of seed planted; second-class land will produce on an average of one *carga* for each *cuartillo* of seed; and third-class land will produce about one-half a *carga*. Thus productivity of the best land is about four times that of the poorest land.

Most Tepoztecans do not use fertilizer in their fields. They are apparently aware of its benefits but, because of the shortage of manure and the expense of commercial fertilizer, are unable to use it.

A few Tepoztecan farmers have attempted to divert seasonal streams, which come down from the mountain forests to their fields, to capture some of the rich humus of the forest, and the results have been spectacular. Portions of fields which received this humus more than tripled their production. There are unfortunately few such streams, and even if all were diverted in this fashion, they would help only a few farmers.

PRODUCTION TIME AND COST

An analysis of production time in plow culture is extremely difficult, because Tepoztecan peasants keep no records and because of the large number of variables to be considered. The following account, based upon careful observation of a few cases and extended interviews with many farmers, is presented with an awareness of some shortcomings on our part.

There is considerable range in the amount of man-days of work that goes into the clearing, planting, cultivation, and harvest of a cornfield. The most important variables are the nature of the terrain, the quality of the soil, the speed of the oxen and the workers, the type of seed used, etc. Judging from our data, the total number of man-days of work needed for the production of one hectare of corn ranges from about 35 to 65 days, depending upon the variables previously mentioned.

If we were to consider 50 man-days of work as an average we would not be far wrong. Actually, however, there are only about 35 days spent working a field of one hectare by any one man. Most men work as day laborers in the fields of others, so that on the average a man puts in about 50 work days in plow culture from the beginning of June to the end of December. However, this estimate does not include many days spent by the farmer in guarding his field against cattle and trespassers.

In Table 31 we present a study of the time spent in the production of corn in a milpa of ten *cuartillos*. In this case we have participated in and carefully observed each of the operations listed. In addition we have obtained estimates of production time from many informants, and some of these are given in Table 32.

It will be seen from these tables that the greatest amount of time is spent in cultivating and harvesting the corn. The preparation of the fields and the planting take relatively little time. The fact that farmers spend a relatively small part of the year at their major occupation gives them a great deal of time for other economic activities, as well as enforced leisure.

2;Lewis E-5 (1943-1948) 1951 NU37 Tepoztlan NU37

TABLE 31. Time Spent in Production of Corn in Plow Culture on Sample Plot, 1944.

Operation	Plot of Ten *Cuartillos*		
	No. of Workers	No. of Days Worked	No. of Man-Days
Clearing of land (*limpia*)	1	3.0	3.0
Plowing (*barbecho*)	1	5.0	5.0
Plowing (*surcado*)	1	1.4	1.4
Seeding (*siembra*)	2	1.4	1.4
First cultivation (*primer mano*)	2	3.0	6.0
Second cultivation (*segundo mano*)	2	2.0	4.0
Third cultivation and hilling (*cajón o desparche*)	2	1.0	2.0
Weeding (*colada*)	1	2.0	2.0
Stripping cornstalks (*zacateo*)	1	6.0	6.0
Tying leaves in bundles (*juntado*)	1	1.0	1.0
Transport leaves (*acarreo*)	1	3.0	3.0
Corn picking (*pizca*)	1	5.0	5.0
Corn transport (*acarreo mazorca*)	1	3.0	3.0
Corn shelling (*desgranado*)	1	5.0	5.0
Total			47.8

The question of estimating costs of production is difficult because Tepoztecans, like most Mexican peasants, do not keep accounts of their expenses, and more important, do not estimate their own labor in terms of its monetary value. They are, however, quite familiar with the value of a day's work in money, since they all hire labor at one time or another, or themselves work for a wage. Tepoztecan farmers are also apt to speak of "time lost" when they are called upon to serve on village guard duty, or if they have to go to court over some legal matter.

Despite the fact that labor time is not so evaluated locally, we have assigned money value to the labor of the farmer-operator to arrive at some notion of relative production costs. In estimating total production costs we have considered the prevailing daily wage of hired labor and the cost of hiring oxen as the two most important items of cost. Our estimates, although approximations, illustrate the wide range in production costs for a single hectare of corn, and the relative cost of each operation. Variations in production costs are due to such factors as differences in

2:Lewis E-5 (1943-1948)1951 NU37 Tepoztlan NU37

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TABLE 32. Estimate of Time Spent in Production of Corn in Plow Culture in Four Sample Plots, 1944.

Operation	Plot I (12 *Cuartillos*)		Plot II (10 *Cuartillos*)		Plot III (10 *Cuartillos*)		Plot IV (10 *Cuartillos*)	
	No. of Workers	No. of Man-Days	No. of Workers	No. of Man-Days	No. of Workers	No. of Man-Days	No. of Workers	No. of Man-Days
Clearing of land	1	4.0	1	6.0	1	3	2	2
Plowing	1	6.0	1	4.0	1	4	2	2
Total		10.0		10.0		7		4
Plowing	1	2.0	1	1.5	1	2	1	1
Seeding	1	2.0	1	1.5	1	2	2	2
Total		4.0		3.0		4		3
First cultivation	2	8.0	2	4.0	2	6	2	2
Second cultivation	1	4.0	2	8.0	1	3	2	2
Third cultivation	1	1.5	1	2.0	1	1	1	1
Weeding	1	3.0	4	4.0	1	1	2	2
Total		16.5		18.0		11		7
Stripping cornstalks	12	12.0	10	10.0	1	5	4	4
Tying leaves in bundles	1	1.0	1	1.0	1	1	1	1
Transport of leaves	1	6.0	1	6.0	1	4	6	6
Corn picking	4	8.0	7	7.0	7	7	4	4
Corn transport	1	3.0	1	6.0	1	3	4	4
Corn shelling	1	6.0	1	7.0	1	3	1	3
Total		36.0		37.0		23		22
Total		66.5		68.0		45		36

[p.146]

2:Lewis E-5 (1943-1948) 1951 NU37 Tepoztlan NU37

slope of field, quality of soil, rockiness of terrain, amount and stubbornness of the weeds, speed of the oxen and workers, and distance from the village.

We have gathered production cost estimates from twenty-five farmers and found considerable variation among them. In Table 33 we present three cases to illustrate the variation of cost of each operation and the range of total costs.

TABLE 33. Estimated Cost of Production of Corn in Plow Culture in Three Sample Plots, 1944.

Operation	Plot I (12 *Cuartillas*)	Plot II (12 *Cuartillas*)	Plot III (12 *Cuartillas*)		
	Value in Pesos	Value in Pesos	Cost of Hired Labor	Value of Own Labor	Total Value
Clearing of land	8.00	7.50	3.00		3.00
Plowing	30.00	15.00		10.00	10.00
Total	38.00	22.50			13.00
Plowing	10.00	8.00		5.00	5.00
Seeding	4.00	4.00	4.00		4.00
Cost of seed	3.60	4.80		3.00	3.00
Total	17.60	16.80			12.00
First cultivation	36.00	16.00	4.00	10.00	14.00
Second cultivation	28.00	12.00	4.00	10.00	14.00
Third cultivation	7.00	7.50	2.00	5.00	7.00
Weeding	6.00	2.50	4.00		4.00
Total	77.00	38.00			39.00
Stripping cornstalks	24.00	15.00		8.00	8.00
Tying of leaves	2.00	3.00			
Transport of leaves	18.00	6.00		12.00	12.00
Corn picking	16.00	12.50	8.00		8.00
Corn transport	9.00	9.00		8.00	8.00
Corn shelling	12.00	10.00		11.50	11.50
Food and drink for peons	10.00	12.00			12.00
Total	91.00	67.50			59.50
Total cost	223.60	144.80			123.50
Amount and value of corn	7 *cargas* 210.00	6 *cargas* 182.00	5 *cargas*		125.00
Amount and value of fodder	12 *cargas* 48.00	12 *cargas* 36.00	8 *cargas*		32.00
Net profit	34.40	73.20			33.50

The production costs in these cases vary as much as 100 pesos and range from 123.50 to 223.60 pesos. The most expensive and most extended operation is harvesting. Harvesting is generally done under a certain amount of pressure, because of the need to be through when others in the same enclosure let in their animals to

2:Lewis E-5 (1943-1948)1951 NU37 Tepoztlan NU37

pasture. For this reason, many farmers hire several peons at this time, involving an outlay of cash. At least one peon is often hired during the plowing and seeding and the first cultivation. Farmers not owning oxen and plows must rent them.

The cost of production does not always have relation to the amount of corn produced, because some fields require more work than others. In the specific cases given in Table 33 the larger production was offset by higher costs (about 32 pesos per *carga* in Plot I) and conversely, the plot which required least outlay in cash or labor yielded the least corn (about 24 pesos per *carga* in Plots II and III). Differences in cash value of the corn produced are due to the changes in market price. Those who are forced to sell immediately after the harvest receive lower prices than those who hold on.

HOE CULTURE

The land used for *tlacolol* (hoe culture) is of two distinct types, located in different areas of the municipio. One type is known as *texcal*, which is covered with black volcanic rock and a semi-deciduous scrub forest in which the leaves fall and rot during the dry season and make a rich but thin topsoil in little pockets among the rocks. The other type of land is known as *cerros*, and refers to the mountainsides. Most of the *cerros* used for *tlacolol* are of lime rockbeds with many rock outcroppings and scrub forests, but of a somewhat different nature than in the *texcal*. Both types of land are at some distance from Tepoztlán, so that the farmers who work this land must spend approximately two hours each way in going and returning from work.

The use of the communal lands for *tlacolol* is a fairly recent phenomenon in spite of the fact that Tepoztlán has had its communal lands since pre-Conquest times. Before the Revolution of 1910-20 during the Díaz regime, the well-to-do *caciques* who controlled the political life of the municipio forcibly prohibited the use of the communal lands for *tlacolol*. As we have indicated earlier, their primary motive was to assure themselves of a labor supply for their own lands. One of the principal changes in the economic life of the village brought about by the Revolution was to deprive the *caciques* of their power and to return to the people the right to use their communal lands. But in the years immediately following the Revolution, that is between 1920 and 1927, relatively few individuals became *tlacololeros*. The population of the village was still small and there was a relative abundance of rentable land because of the absence of many families from the village.

In 1927 the municipio lost control of the *tlacolol* lands, which passed to the jurisdiction of the forestry department. At this time Tepoztecans lost their right to work *tlacolol* because the forestry department, as part of its national program of conservation and prevention of soil erosion, forbade the indiscriminate cutting and burning of trees—an integral part of the process of preparing *tlacolol* land for cultivation. With the rapid increase of population in the thirties, the shortage of land became acute and the need for the *tlacolol* land urgent. Many individuals began to open *tlacolol* plots illegally and were fined.

2:Lewis E-5 (1943-1948)1951 NU37 Tepoztlan NU37

land and *ejido*. Most of the families who either owned private land or held *ejido* or both and who also worked *tlacolol* had turned to *tlacolol* because their holdings were too small to support their families. But there is a trend among even the better-to-do families to turn back to *tlacolol;* for example, twelve of the twenty families who owned private land, held an *ejido* grant, and worked *tlacolol*, were among the large landowners.

SIZE OF CLEARINGS

Most *tlacolol* clearings are small, averaging between eight and twelve *cuartillos* of seed. The largest *tlacolol* operator in the village plants only thirty-five *cuartillos*. As we shall see, the great amount of labor necessary for clearing *tlacolol* land is the most important limiting factor in the size of clearings used. A related factor, however, is the growing shortage of land which has sufficiently grown back into forest after earlier clearings. Furthermore, *tlacolol* is definitely viewed as subsistence agriculture, and any man who cleared inordinately large areas, even if he could, would incur the wrath of the other villagers.

TOOLS OF PRODUCTION

Plow and oxen are ruled out in *tlacolol* because of the nature of the terrain. In *texcal* the large volcanic rocks lie around helter skelter, so that it is difficult for a man even to walk. Similarly the steep slopes of the *cerros*, and the lime outcroppings make the plow and oxen impractical. In both types of *tlacolol*, the tools used are the *coa*, *tlalache*, *cuxala*, *azadón*, and machete. (See Fig. 29.) They are homemade except for the iron tips in the hoe and machete, which are bought. Thus, in contrast to farmers in plow culture, most *tlacololeros* own their own tools. The cost of the *tlalache* and the *coa* are shown in Table 35.

TABLE 35. Cost of *Tlalache* and *Coa*, Tools Used in *Tlacolol*.

Year	Cost in Pesos	
	Tlalache	*Coa*
1926	1.50	1.25
1935	2.25	1.75
1940	3.00	2.25
1944	5.50	3.25

WORK CYCLE AND PRODUCTION TECHNIQUES

Preparation of Land: Work in *tlacolol* begins in January. The trees are cut with an ax, and the bush is cleared with a machete, extremely difficult and time-consuming work. It takes approximately 40 to 50 days for a man to clear enough land for the planting of 12 *cuartillos* of corn. The trees and brush dry out and are burned in April, and the ashes are left to "fertilize" the soil. Burning is generally done in a single day with two or three men working together. If the materials are not all burned, the group will return and work another day. Enclosures of rocks

2:Lewis E-5 (1943-1948) 1951 NU37 Tepoztlan NU37

and brush are then built around the clearing to keep out stray animals that usually graze in these areas. Most *tlacolol* clearings are used two years in succession, and the work of clearing is considerably reduced the second year, although it generally takes 10 to 15 days to clear the milpa of weeds the second year.

Planting: Planting in *tlacolol* begins in May, before the rains. This planting of the corn "dry," as Tepoztecans say, eliminates the danger of rodents getting at it. The corn used in *tlacolol* is a very hardy variety which sends roots out in all directions and which penetrates the rocky terrain. In planting, the *coxala* or *coa* are used.

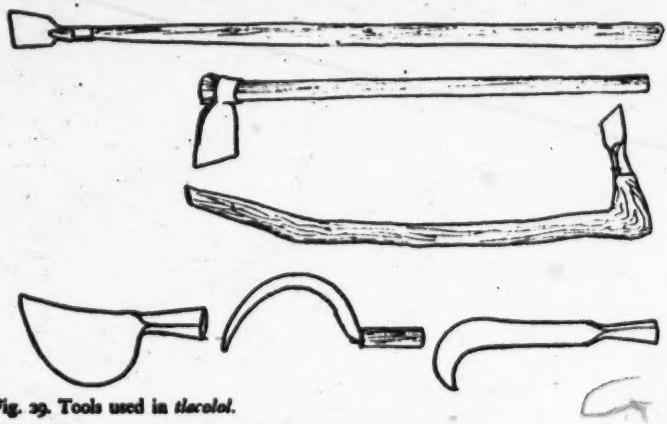

Fig. 29. Tools used in *tlacolol*.

A small hole about four to six inches deep is made wherever there is enough soil, and seeds are dropped in. Every interstitial space among the rocks is used. There are therefore no orderly rows in the planting. Beans and squash may be planted with the corn. A good worker can plant about one-half to three-quarters of a *cuartillo* a day; at this rate it would take about twenty man-days to plant the equivalent of one hectare of corn in *tlacolol*.

Cultivation: Unlike plow culture, there is no cultivation in *tlacolol*, nor is the corn hilled. There is generally at least one weeding which is done about forty days after planting, when the corn is about two feet tall. Weeding is of two kinds. In one kind, the weeds are pulled out by hand, and this process is known as the *tlamaltequa*. This is the preferred process, and it is believed that yields are higher if it is done this way. However, this is difficult and time-consuming. One man can weed about three *cuartillos* per day in *tlacolol* of *texcal* and considerably less in *tlacolol* of *cerro*. If there is some delay on the part of the farmer and if the weeds have grown very tall by the time weeding is begun, the machete is used. (See Fig. 30.)

After the weeding, the milpa is left alone except for occasional visits to check the enclosures. Sometimes night visits will be made and firecrackers will be set

2:Lewis E-5 (1943-1948)1951 NU37 Tepoztlan NU37

243
291
516

Fig. 30. Weeding with machetes in *tlacolol* of *cerros*.

2:Lewis E-5 (1943-1948) 1951 NU37 Tepoztlan NU37

off at intervals all night to frighten away the rodents who have been getting after the corn. It is believed that a good fireworks session will keep them away for as long as two weeks.

Harvest: The harvest procedures are very similar to that of plow culture, except that most *tlacololeros* do not transport the fodder because the distances are too long, and it is considered uneconomical. Also most *tlacololeros* are poor and do not own a horse or burro and must hire them.

YIELD

Corn yields in newly cleared *tlacolol* fields are high, much higher than yields in plow culture. A normal yield on a newly cleared plot of *tlacolol* is about two *cargas* for each *cuartillo* of corn planted, and even three *cargas* are not unusual. But the yields decrease very markedly the second year, and most milpas are then abandoned for a new clearing because of the exhaustion of the slight top humus. The yields in *tlacolol* of *texcal* are somewhat higher than those in the *cerros*.

PRODUCTION TIME AND COST

An estimation of the time required in the production of corn in *tlacolol* must take into consideration both the *texcal* and the *cerro* plantings because of the variations within each. Table 36 compares the approximate number of man-days spent on each operation in both types of *tlacolol*.

TABLE 36. Estimated Time Spent in Production of Corn in *Tlacolol*, 1944.

Operation	Man-Days Spent in *Tlacolol* Clearing	
	Texcal (10 *Cuartillos*)	*Cerro* (7 *Cuartillos*)
Clearing with machete and ax	40	21
Fencing with poles	12	20
Burning	8	1
Seeding with *coa*	12	7
Reseeding	4	2
Weeding by hand	30	40
Repairing fence	—	40
	12	8
Transporting corn	10	15
Shelling corn (15 *cargas*)	15	7
Total	143	161

Despite the fact that our sample from the *cerro tlacolol* is a smaller plot, it took thirty-eight days to work it. Taking into consideration differences in the size of

2:Lewis E-5 (1943-1948)1951 NU37 Tepoztlan NU37

243 433 [461] both plots, the most obvious difference in production time is in clearing and fencing the land. Due to the rougher terrain, clearing and burning in *texcal* are more difficult and time-consuming than in *cerros*. On the other hand, because of the greater threat from grazing cattle, the building and repairing of fences are more time-consuming in the *cerros*.

Estimated costs of production based upon the same two plots clearly demonstrate the wide range in costs which prevails in Tepoztlán. (See Table 37.)

TABLE 37. Estimated Cost of Production of Corn in *Tlacolol*, 1944.

Operation	Pesos Spent in *Tlacolol* Clearing					
	Texcal (10 *Cuartillos*)			*Cerro* (7 *Cuartillos*)		
	Hired Labor	Own Labor	Total	Hired Labor	Own Labor	Total
Clearing with machete and ax		60.00	60.00		31.50	31.50
Fencing with poles		18.00	18.00	17.50	17.50	35.00
Burning		12.00	12.00		1.50	1.50
Seeding with *coxolo*		18.00	18.00		10.50	10.50
Reseeding		3.00	3.00		3.00	3.00
Seed			3.00			2.10
Seed for reseeding			.40			.20
Weeding by hand		54.00	54.00	21.00	60.00	81.00
Repairing fence					39.00	39.00
Harvesting		18.00	18.00		12.00	12.00
Transporting corn	15.00		15.00	22.50		22.50
Shelling corn		22.50	22.50		13.50	13.50
Total	15.00	205.50	225.90	61.00	188.50	251.80
Amount and value of corn produced	15 *cargas* at 30.00 each		450.00	9 *cargas* at 30.00 each		270.00
Total cost and value			225.90			251.80
Net profit			226.10			18.20

The lower yields and higher costs of producing corn in the *cerro tlacolol* as compared with the *texcal tlacolol* make the *cerro* less economical to work, and it is also more time-consuming. But since the families who work *tlacolol* are for the most part subsistence farmers, our comparisons of the relative profits involved in each type are strictly for purposes of analysis.

PLOW AND HOE CULTURE COMPARED

243 [423] Now that we have examined both plow and hoe culture, as they are carried on in Tepoztlán, let us compare the two systems in some of their more important characteristics. We have seen that there are more families engaged in plow culture than in *tlacolol*, and that there is overlapping in that some families participate in both systems. The distribution of the families who work private holdings, *ejido*

2:Lewis E-5 (1943-1948) 1951 NU37 Tepoztlan NU37

holdings, and *tlacolol* is approximately as follows: 36 per cent of all families operate private land; 31 per cent operate *ejido* parcels; and 20.9 per cent operate *tlacolol*. Since both *ejido* and private parcels employ plow culture, it is evident that the *tlacololeros* constitute by far the smallest group. Hoe culture is secondary in importance to plow culture from the point of view of the number of families engaged in each. This is seen even more clearly when we recall that all but 96 of the *tlacololero* families had an *ejido* parcel, a private milpa, or both. However, *tlacolol* is still very important in the total economy of the village.

One of the most striking differences between the two systems is the much greater amount of time necessary in hoe culture. It will be seen from Table 38 that it takes approximately two-thirds more man-days to produce one hectare of corn in *tlacolol* than it does in plow culture. As we have seen, the single job of weeding by hand takes more time than all three cultivations with plow. The great difference in the total time spent in preparation of the land is also noteworthy. The somewhat longer time period for harvesting and transport is due to the greater distances of *tlacolol* fields from the village and the larger relative production of the *tlacolol* milpas. It should be noted that fencing the *tlacolol*, which is so time-consuming, has to be repeated each time a new *tlacolol* is opened—in contrast with the permanent stone fences of private milpas and *ejidos*.

TABLE 38. Comparison of Time Spent in Production of Corn in Plow and Hoe Culture.

Operation	Man-Days Spent on Plot of One Hectare	
	Plow Culture	Hoe Culture (*Tercal*)
Preparation of the land	8.0	60
Planting	2.8	16
Cultivation	14.0	30
Harvest	15.0	12
Transporting corn	3.0	10
Shelling Corn	5.0	15
Total	47.8	143

In addition to the differences in the actual time spent there is a corresponding difference in the nature of the work. Tepoztecans who have worked in both types consider work in *tlacolol* infinitely more exhausting than work in plow culture. The *tlacololeros* are in a sense perpetual pioneers who are always making new clearings in the forest. Also, weeding by hand is very difficult and leaves welts for days on the hands of the toughest *tlacololero*. It is said in the village that a *tlacololero* is known by his hands.

Another very important point is the difference in time pressure demanded by each system of agriculture. On the whole there is much less time pressure in *tlacolol*. A man can clear his land anytime between January and April. He can work for a few days at clearing, spend a few days doing some other job, and then return to

2:Lewis E-5 (1943-1948)1951 NU37 Tepoztlan NU37

clearing. After planting there is also considerable leeway before the first and only weeding. This is not the case in plow culture. Although there is considerable leeway in the time of planting, once planting has been done, the cultivations must follow soon after at regular intervals or the yields will be cut appreciably. Furthermore, there is need to take advantage of dry days when the oxen can get into the field.

The differences between the work cycles of the two systems are shown in Chart 2.

CHART 2. Comparison of Work Cycles in Plow and Hoe Culture, 1944.

PLOW CULTURE	MONTH	HOE CULTURE
	JANUARY	Clear land with machete and ax.
	FEBRUARY	Clear land with machete and ax.
No work in fields.	MARCH	No work.
	APRIL	Burning brush. Fencing, seeding.
Clearing land, plowing and seeding.	MAY	Burning brush. Fencing, seeding.
	JUNE	Reseeding.
First cultivation.	JULY	Reseeding.
Second cultivation. Third cultivation.	AUGUST	Weeding.
Visits to field.	SEPTEMBER	Visits to field.
Weeding.	OCTOBER	Visits to field.
Stripping corn stalks.	NOVEMBER	Visits to field.
Harvesting and transporting corn.	DECEMBER	Harvesting and transporting corn.

It will be seen that the agricultural year begins at different times in each case. The *tlacololeros* begin work very soon after the harvest and work through the larger part of the dry season, while the farmers of plow culture let their land rest, except for a relatively few farmers who plow new land in January or March. The fact that different farm families in the same village are engaged in different activities during the same season of the year adds to the complexity of village life. Here again, the picture of homogeneity in activities which is so often associated with so-called folk cultures has to be modified. Most *tlacololeros* are through planting before planting begins in plow culture, and many accept work as peons in plow culture. However, during late July and early August the peak labor season for plow culture finds *tlacololeros* busy in their own fields. Similarly, harvest comes at the same time in both systems and it is at this time that there is a labor shortage in the village. Many Tepoztecans have described this overlapping of work cycles as a conflict of interests between *tlacololeros* and milpa owners, for the latter are unable to get sufficient hired help.

A comparison of the yields of the two types of agriculture reveals that hoe culture yields are equal to the best yields in plow culture and are generally about twice as high as the average yields of plow culture. These larger yields make hoe

2:Lewis E-5 (1943-1948) 1951 NU37 Tepoztlan NU37

culture quite attractive. One might ask therefore why more people do not work *tlacolol*. There are a number of reasons. First, the difficulty of the work discourages many, and the fact that *tlacolol* has traditionally been viewed as work for the poor is also undoubtedly a factor. Second, many families who have worked as peons have no corn at the harvest and have to seek some cash income regularly to support their families. In other words, even in the case of *tlacolol* which takes so little capital a man must have corn to support his family if he is to spend the long periods of time necessary for clearing the scrub forest. Third, and by far the most important consideration, is the limited amount of *tlacolol* land; a shortage which is being felt more and more as the number of *tlacololeros* has increased. The *tlacolol* system of cutting and burning, by its very nature, demands large reserve areas; it takes about ten years for cleared land to grow back into scrub forest and be worth clearing again. If all the villagers were to open *tlacolol* clearings in a single year, there would be no possibility of planting in new clearings again for at least ten years.

The costs of hoe culture in terms of the value of man-days are much higher than in plow culture, but by the same token little hired labor is used. *Tlacolol* is practical only for people with a lot of time and little capital. It is much too inefficient a system for production for the market on a large scale. As we have seen in Table 37, there is considerable range in costs even in hoe culture. Most of this range in the cases cited is due to the difference between the two types of terrain used in hoe culture, that is, *cerro tlacolol* and *texcal tlacolol*. In the *cerro*, fencing is a much more time-consuming operation because there is more danger of cattle getting into the fields, but cattle rarely get into the *texcal*.

This brings us to one of the crucial problems in Tepoztlán, namely, the rapid increase of population with no accompanying increase in resources or improvement in production techniques. On the contrary, the increase in the number of *tlacololeros* represents a return to a more primitive type of production in an effort to escape the devastating effects of a money economy during a period of inflation. We have already noted the sharp rise in the cost of renting or buying a team of oxen as well as other tools of plow culture, and we have also noted that only about one-third of all landowners have their own oxen teams. Labor costs have also gone up, and indeed the wages paid to day laborers in Tepoztlán are considerably higher than in other parts of Mexico, perhaps because of the proximity of Tepoztlán to large urban centers. In any case these costs are beyond the capacity of many Tepoztecans, and they turn to *tlacolol*. *Tlacolol* has eased for many the shock of the rapid rise in prices. Although it is helping to resolve the immediate problem, it by no means offers a satisfactory solution. In fact, it increases the problems to be faced.

Were Tepoztlán a primitive culture with the usual high birth rate and high death rate, and stable and small population, the technique of *tlacolol*, though wasteful and inefficient, might be workable. But in the face of an ever-increasing population and higher standards of living, the primitive techniques of *tlacolol* no longer seem to be feasible. The necessity of clearing new plots of land every third year, the rapid depletion of the land and its forest resources, and the consequent danger of erosion are problems which will soon have to be reckoned with.

.2:Lewis E-5 (1943-1948) 1951 NU37 Tepoztlan NU37

is to provide women with an excuse for visiting each other, and that it has extended their social life.

There are less than a dozen battery-operated radios in the village, and most of them have been purchased since 1944. There are also about 44 spring-driven phonographs.

DIET

As in rural Mexico as a whole, the basic diet of the people of Tepoztlán consists of corn, beans, and chile. Squash, which was reported by Redfield to be an important element in the food complex of Tepoztlán, is not part of the regular daily diet and is eaten only a few months of the year. The proportion of corn, beans, and chile in the diet varies sharply from family to family and depends upon the season, income, and food habits of the family. The consumption of corn, which is the major food staple, ranges from 10 per cent to as much as 70 per cent of the family diet. In general, the poorer the family, the higher the proportion of corn, beans, and chile in the diet.

Yellow corn is most commonly used in Tepoztlán, but blue and white corn is also locally grown and used. Corn is most frequently eaten in the form of tortillas and occasionally in the form of *atole* (gruel). Tamales made of corn dough are eaten at certain fiestas; corn *pozole* and corn *pinole* are known but are not characteristic foods in this village. The preparation of the corn dough or *nixtamal* with lime is the same in Tepoztlán as in other parts of Mexico. There is a wide variety of beans in Tepoztlán, but the most commonly eaten are red kidney beans cooked with lard, chile, and sometimes tomato and onion. Green chile, ground with onion and tomato, is prepared daily as a sauce to be eaten with tortilla and whatever other foods are served. *Chile pasilla*, a large dried red chile, is more expensive and is generally reserved for use in the fiesta *mole* sauce.

The basic diet is supplemented by many other foods which are either locally cultivated, gathered wild, or purchased in the stores and market place. Among the foods used in Tepoztlán are the following:

zapote	beans	honey
banana	avocado	spices
orange	hog plum	herbs
lemon, lime	*chirimoya*	beef
grapefruit	*mameys*	pork
chayote	papaya	chicken
manzanillos	mango	turkey
tomato	squash	milk
sugar cane	peanuts	eggs
pitos	coffee	cheese
acacia seeds	prickly pear	clotted cream

The fields, forests, and mountain sides provide many free foods the year round. There are several varieties of wild edible greens, which are important in that they

2;Lewis E-5 (1943-1948)1951 NU37 Tepoztlan NU37

114 121 181 771 The second conclusion in the study in Yucatán showed a clear trend toward secularization.

> The conclusion has been reached that the city and town exhibit greater secularization than do the villages. The principal facts offered in support of this conclusion are . . . the separation of maize from the context of religion and its treatment simply as a means of getting food or money; the increase in the number of specialists who carry on their activities for a practical livelihood relative to those that carry on traditional activities which are regarded as prerogatives and even moral duties to the community; the change in the character of the institution of *guardia* whereby from being an obligation, religiously supported, to protect a shrine and a god it becomes a mere job in the town hall; the (almost complete) disappearance of family worship; the decline in the sacramental character of baptism and marriage; the conversion of the pagan cult from what is truly religious worship to mere magic or even superstition; the decline in the veneration accorded the santos; the change in the novena in which from being a traditional form expressive of appeal to deity it becomes a party for the fun of the participants; the alteration in the festival of the patron saint in which it loses its predominant character as worship and becomes play and an opportunity for profit; the separation of ideas as to the cause and cure of sickness from conceptions as to moral or religious obligation.[*]

114 121 181 243 771 The data from Tepoztlán does not enable a careful comparison on each of the cited points. However, much of the data is comparable and shows the trend toward secularization noted. The attitude toward corn in Tepoztlán combines both the secular and religious. Certainly corn is viewed as the basic crop, both for subsistence and for trade. But the religious aspects have not been entirely lopped off. The corn is still blessed in the church on San Isidro's day, and some families still burn incense in the home and address a prayer to the corn before planting. Some also make the sign of the cross when planting the first seed. Moreover, on the day of San Miguel, crosses are still placed at the four corners of the milpa to ward off the winds. From informants' accounts, it appears that these customs were more widespread before the Revolution. It is difficult to say how much change has occurred since 1926, for Redfield did not report on this subject.

114 121 181 463 The study of occupational changes and division of labor in Tepoztlán showed that most of the old "folk specialists" have continued and even increased in number, side by side with the increase in the new specialists. There were more *curanderos, chirimiteros,* fireworks makers and mask makers in 1944 than in 1926, and there seemed to be every indication that these occupations would continue. The only exceptions are the *huehuechiques,* who must be able to speak Náhuatl, and the *chirimiteros,* who are being displaced by the modern band. However, the rate of increase in what Redfield would call the secular specialists has been much greater than that of the "folk specialists." To this extent the independent findings for

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114 121 181 182 force the analysis into an organization-disorganization framework and neglect the possibility that there may exist different levels of organization in cultures. . . ." Neal Gross, "Cultural Variables in Rural Communities," *American Journal of Sociology,* Vol. LIV, No. 5 (March, 1948), pp. 348-456.

[*] *Ibid.,* p. 352.

2:Lewis E-5 (1943-1948) 1951 NU37 Tepoztlan NU37

Appendixes

A. *AN INTENSIVE SURVEY OF MAIZE IN TEPOZTLÁN*

BY EDGAR ANDERSON

243

More than any other crop plant, maize is a sensitive mirror of the people who grow it. There are myriads of varieties and they fall into a few ill-defined races. Any two varieties can cross and frequently do so if they are grown near each other, since maize is naturally cross-pollinated and the wind blows the pollen from one field to another. By their type and their departures from it, fields of maize bear witness to the history of the peoples who are growing them. By their uniformity to type they show the skill of those who selected the seeds. Their beauty, their yield, the purposes for which they are adopted, all portray the attitudes and scale of values of their cultivators.

Maize in Mexico varies from plant to plant, from field to field, from variety to variety, and from region to region. The usual variation in kernel color which is so noticeable to one accustomed to the puritanical uniformity of field crops in the United States, is relatively superficial. It often masks, to American eyes, the fact that an Indian variety may be more morphologically uniform than modern commercial varieties which have been selected for a single color. Of all the characteristics of a variety, the shape of the ear is probably the most significant, but it has been found difficult to measure effectively. The number of rows of kernels, the width of the kernels, the extent to which they are pointed at the apex, and the texture of their starch (from flinty to floury) have proved more reliable (Anderson and Cutler, 1942; Anderson, 1946).

A fairly well systematized method of making standard 25 ear samples from fields or corn cribs has been worked out, the results being condensed into a pictorialized scatter diagram which serves as a record. These diagrams lend themselves to the making of exact comparisons between varieties or regions or cultures. (See Anderson, 1946 and 1948, for details and examples.)

For at least seven hundred years, the maize of western Mexico has been markedly different from that of the Mesa Central. Modern commerce may have blurred this boundary, but it has not obliterated it. The varieties of maize grown in the region west of Guadalajara, for instance, belong to the race which Anderson has named "Mexican Narrow Ear"; those in the vicinity of Mexico City to the race previously designated "Mexican Pyramidal" by Anderson and Cutler. So different are they that not a single ear raised in the one region could be duplicated by one from the other, in spite of the great variability in both areas. The maize of Tepoztlán is of particular interest because it comes from one of the places where the dividing line between these two races is quite sharp. To the north lies the region of Mexican Pyramidal, with its various sub-races and mongrels. To the west and south is a region long characterized by Mexican Narrow Ear, in which various commercial blends of these and other races are now pushing rapidly westward.

Through the cooperation of Dr. Lee Lenz (now of the Rancho Santa Ana Botanical Garden) and of Dr. J. G. Harrar of the Rockefeller Foundation and several of his staff, it was possible to make an intensive survey of the variation in the maize of Tepoztlán. Ninety-eight samples of 25 ears each were taken in the winter of 1947-48, the sampling

2:Lewis E-5 (1943-1948)1951 NU37 Tepoztlan NU37

243 being distributed as evenly as possible between the various barrios and villages. From each of the seven barrios eight samples were taken, two each from fields in the *cerro*, two each from corrals, two from *texcal* land, and two from *valle* milpas. Similar samples were taken from the seven outlying pueblos, Santiago, Ixcatepec, Ocotitlán, San Juan, Gabriel Mariaca, San Andrés Calera, and Amatlán. From only one of these pueblos was it possible to obtain eight samples; from Gabriel Mariaca there were only four and from the remainder only six each, but they too were reasonably well distributed between the four types of site so that from the municipio as a whole we have 25 *cerro* samples, 25 corral samples, 23 *texcal*, and 25 *valle*. (See Fig. 1.)

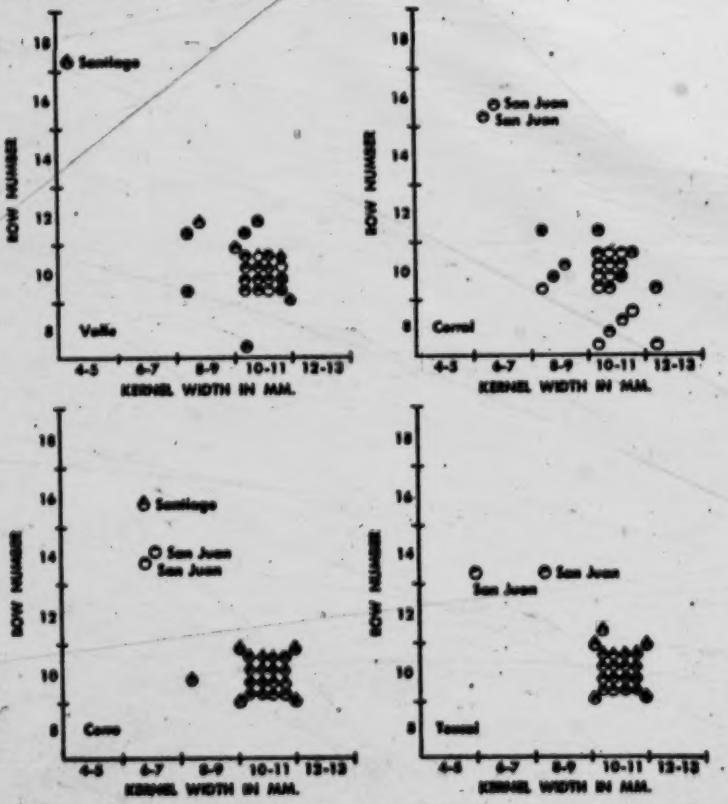

Fig. 1. Scatter diagrams of *cerro*, *valle*, *corral*, and *texcal* samples. Each glyph is the average of a twenty-five ear sample. The shape of the glyph indicates how pointed the kernels were on the average. The amount of black in each glyph is roughly proportional to the amount of soft starch in the kernel.

2:Lewis E-5 (1943-1948) 1951 NU37 Tepoztlan NU37

243

The most outstanding fact revealed by this survey is that the maize of Tepoztlán is surprisingly uniform. It is uniform within many of the samples. As many as 20 ears out of a sample of 25 may be identical in row number and kernel size. It is also uniform between samples. The sample averages for *cerro*, *valle*, and *texcal* are either identical or differ in only a single detail for virtually all the samples from the municipio. Of the 2,450 ears which were measured, approximately forty per cent fell in the modal cell of the summary chart. That is to say that 995 out of the 2,450 ears had the same row number and kernel size. While there are other native American communities with as great or even greater maize uniformity, such a condition is unusual in much of Mexico, where diverse types, some of them highly differentiated, may be grown in the same village, and even by the same individual.

Furthermore only two samples out of the 98 are good characteristic Mexican Pyramidal, though several of the others show its influence. The modal type, though not typical Mexican Narrow Ear, is closer to that than it is to Mexican Pyramidal. It is 10-rowed, like much of the maize in western Mexico but the kernels are smaller (10-11 mm. in diameter), they are slightly dented on the average, and slightly pointed, suggesting a slight infiltration of Mexican Pyramidal germ plasm. On the other hand, their prevailing uniformity suggests that this contamination may have taken place long ago, since the modal type is now so strongly stabilized. Since the maize of Tepoztlán is so prevailingly uniform, pueblo and barrio differences are most readily discussed by showing the extent to which these differ from the usual type.

One of the villages, San Juan, has an outstandingly different type of maize. It averages fourteen rows, and the kernels are small and flinty. In spite of the higher row number, it shows neither the pointing nor the denting which so frequently accompany high row number in the Mesa Central. All three of these characters (row numbers of fourteen, small kernels, and flinty kernels) are very ancient characters in maize, though not typical for most of Mexico.

One of the other pueblos, Santiago, shows obvious signs of influence from the Mesa Central. We have six samples of maize from this pueblo. Two are typical Mexican Pyramidal, many rowed, pointed dents, one with a modal row number of sixteen, the other of eighteen. Two other samples from this pueblo are intermediate between these and typical Tepoztlán maize, the other two have the usual Tepoztlán mode, but each sample includes several ears with highly dented, sharply pointed kernels, suggesting crosses with Mexican Pyramidal varieties. In one sample from Los Reyes, two from La Santísima, and one from Santo Domingo, a minority of the ears show unmistakable signs of Mexican Pyramidal influence.

There is little differentiation, on the whole, between the maize grown in the *valle*, the *texcal*, and the *cerro* plots, though the *valle* samples are slightly less pointed than the other two, and their averages vary a little more from one to the other. The corral samples, however, show a distinct tendency to be more frequently eight-rowed and to be much less pointed than the other three. This undoubtedly means that the corral maize is a more or less differentiated type. In all probability it is frequently designed to be used as *elotes*, or for other special dishes prepared from maize in the roasting ear stage. There is a general tendency, over much of Mexico, to grow more or less specialized varieties for these purposes, and particularly in western Mexico these *elote* varieties tend to be characterized by a wider kernel and by fewer row numbers, than the ordinary maize of the milpas.

2:Lewis E-5 (1943-1948)1951 NU37 Tepoztlan NU37

184
243

The maize samples may also be used to examine the comparative uniformity of harvested maize in the different barrios and pueblos. Uniformity of maize in Mexico and Central America is a rough measure of the pride and skill with which the maize crop has been selected and grown. Conservative Indian communities, which have preserved their old customs, have the most uniformity, skilled agriculturists are next in order, and the more or less urbanized *pobrecitos*, who have lost much of their Indian tradition, have the most variable maize crops. In this respect there is little difference between the barrios. They all have moderately uniform samples, much more uniform for example than similar samples from S. P. Tlaquepaque (Jalisco). The samples from the barrio of San Pedro are the most uniform of the lot. Among the pueblos, Ixcatepec is outstanding but in the other direction. All six of its samples are variable, two of them so markedly so as to reflect upon the integrity of its agricultural traditions.